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SEPTEMBER-1973, No. 9

FISHING INFORMATION

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MARINE
FISHERIES
SERVICE

OUTHWEST
FISHERIES
CENTER
LA JOLLA,
CALIFORNIA

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
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FISHING INFORMATION

SEPTEMBER 1973, No. 9

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PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) a narrative description of subsurface temperature structure for parts of the North Pacific, 4) charts of winds and pressures for the eastern North Pacific, 5) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 6) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. This is a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

L. E. Eber, Leader
Fishery Information Systems
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La Jolla, California

Submitted for publication - October 19, 1973

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L. Eber (Figures 4 and 6), F. Miller (Figures 9 and 10)
J. Renner (Figures 1, 2, 3, 5, 7, and 8), J.F.T. Saur (Figures 11 and 12)
J.L. Squire (Figure 13)

TECHNICAL EDITOR:
K. Raymond

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Expendable bathythermograph observations are made by the mates of the S.S. Hawaiian Enterprise of Matson Navigation Co., and S.S. Chevron California of Chevron Shipping Co., and processed with assistance from the NMFS Pacific Environmental Group, Monterey. The project was partially supported by National Science Foundation Grant AG-256 and the Office of Naval Research, Gov. Order NAonr-9-74.

Sea Surface Temperature and Environmental Conditions

L. EBER AND F. MILLER

Eastern North Pacific

Fall cooling was in evidence off southern California and Baja California out to 120°W by decreasing sea surface temperatures from August - September 1973. Cooling also occurred in the Gulf of Alaska and in areas south of the Aleutian Islands to about 35°N. Surface waters warmed, however, in coastal and offshore waters from Point Conception to north of Vancouver Island and in most mid-ocean areas south of 35°N.

The effect of the coastal and offshore warming off the Pacific Northwest was to reduce the magnitude of negative departures from normal found in August. South of 35°N, however, negative departures intensified in September, particularly along the southern part of Baja California (Figure 5). Anomalously cold surface temperature conditions also increased in the Gulf of Alaska and south of the Aleutian Islands. The largest negative departures from normal exceeded 4°F (2.2°C) at latitudes 40°-45°N, between 160° and 170°W. A relatively cold pool of surface water has persisted in this general vicinity since July 1973.

The main feature of the mean sea level pressure pattern in September 1973 was the eastern North Pacific high stretched along an east-west axis between 30° and 35°N (Figure 2). Compared to the long-term means, pressures were below normal in the region west of Oregon, Washington and British Columbia to about 155°W and above normal in most other regions. While nowhere very intense, the pattern of anomalous pressures was associated with weakened northerly winds from the coast out to about 140°W, between latitudes 30° and 50°N, except along southern California. This condition contributed to less than normal heat loss by evaporation and probably reduced transport of cold water southward and, thereby, to the anomalous warming of sea surface temperatures.

On the other hand, the intensification of cold temperature conditions between latitudes 40° and 45°N, west of 155°W was assisted by relatively stronger and more northerly winds than normal.

Western North Pacific

Sea surface temperature conditions in the western North Pacific were a little warmer than normal during September 1973 in most of the region between latitudes 20° and 40°N (Figure 6). The principal exception to this is found in the area east of northern Honshu where temperatures were below normal, in contrast to above-normal values in the previous month.

North of latitude 40°N. temperatures continued to be relatively cool with maximum deviations of 2°F (1.1°C) or more in the area east of 170°E.

Eastern Tropical Pacific

Sea surface temperatures in September 1973 changed very little from August over most of the eastern tropical Pacific (Figure 9). The cold upwelling along the coast of South America and south of the equator out to 140°W was a persistent feature throughout the month. The equatorial frontal boundary on the north side of the Peru Current and its equatorial extension was as well defined in September as it was in August, particularly east of 100°W. Surface temperatures cooled significantly between 105°W and 125°W from 5°N to the equator because the southeast trades averaged 15 knots during the month and induced considerable mixing (Figures 9 and 10).

North of the equator surface temperatures of 82°F (27.8°C) or greater covered a slightly wider latitudinal band west of 120°W than in August. However, temperatures east of 110°W were below normal until late in the month when considerable surface warming took place along the coast of Central America as a result of light winds and decreased cloud cover. Hurricane Irah developed in the warm water off Mexico in late September and left the waters somewhat cooler in her wake. In the area west of Baja California, the negative temperature anomalies were significantly greater than in August. Persistent and extensive low stratus clouds and steady northerlies of 10-15 knots helped to perpetuate and increase the cooling in this area.

Subsurface Temperature Structure in the Northeast Pacific Ocean

J.F.T. SAUR

Observations of subsurface temperature structure between San Francisco and Hawaii were taken during the last week in August (Figure 10) and in mid-September (Figure 11). Note that the Chevron California followed a Rhumb line course for the first section, while the Hawaiian Enterprise followed a great circle course. The great circle course is about 70-80 miles north of the Rhumb line course at 140°W. Since the Transition Zone generally lies approximately westnorthwest to eastsoutheast, the difference between the courses results in some apparent eastward displacement of mid-section features in the section along the Rhumb line (Figure 10).

The susceptibility of the surface layers to exhibit short-term changes in late summer is shown by these sections. In late August, a fairly well-mixed surface layer about 40 meters deep extended along almost the entire section. At mid-September a well mixed layer was found only at stations 16-20 at the Hawaiian end of the section. Along the rest of the section there remained an isothermal layer between depths of 20 m and 40 m above a sharp thermocline at 50-60 m depth. However, warming of 0.5°-1.0°C occurred at the surface so the vertical profiles (stations 2, 6, and 13 in Figure 11) showed a gradient between the surface and 20 m. Because of the paucity of observations within 200 miles of the California coast, due to observational failures, it is unrealistic to attempt to evaluate any change in upwelling conditions since mid-August.

Along the usual great circle route the boundary between the waters of the California Current and the Transition Zone lay very near station 5 at 134°W, about 550 nautical miles from the coast. The sharp rise in salinity occurs between stations 5 and 6, yet the vertical spread between the 13° and 15°C isotherms at station 5 indicates an influence of warm water between 60 and 140 m, which is typical of the Transition Zone.

The western boundary of the Transition Zone apparently was located between stations 9 and 10 in Figure 11. Another westward rise in the surface salinity occurred between these stations about 1000 miles from the coast, and the spread of the subsurface isotherms at depths of 100 m is decreasing at station 10.

The temperature band between 16° and 19°C is again shaded because this falls within the "optimal temperature range" for albacore. The region where this band intersects the surface still lies within the California Current region as it has since mid-July. It is also no deeper than 80 m in this region. Under typical conditions significant surface cooling begins in October, which should cause the surface mixed layer to deepen and the optimal temperature range to begin to retreat westward away from the California coast.

Airborne Infrared Sea Surface Temperature Survey Off San Diego

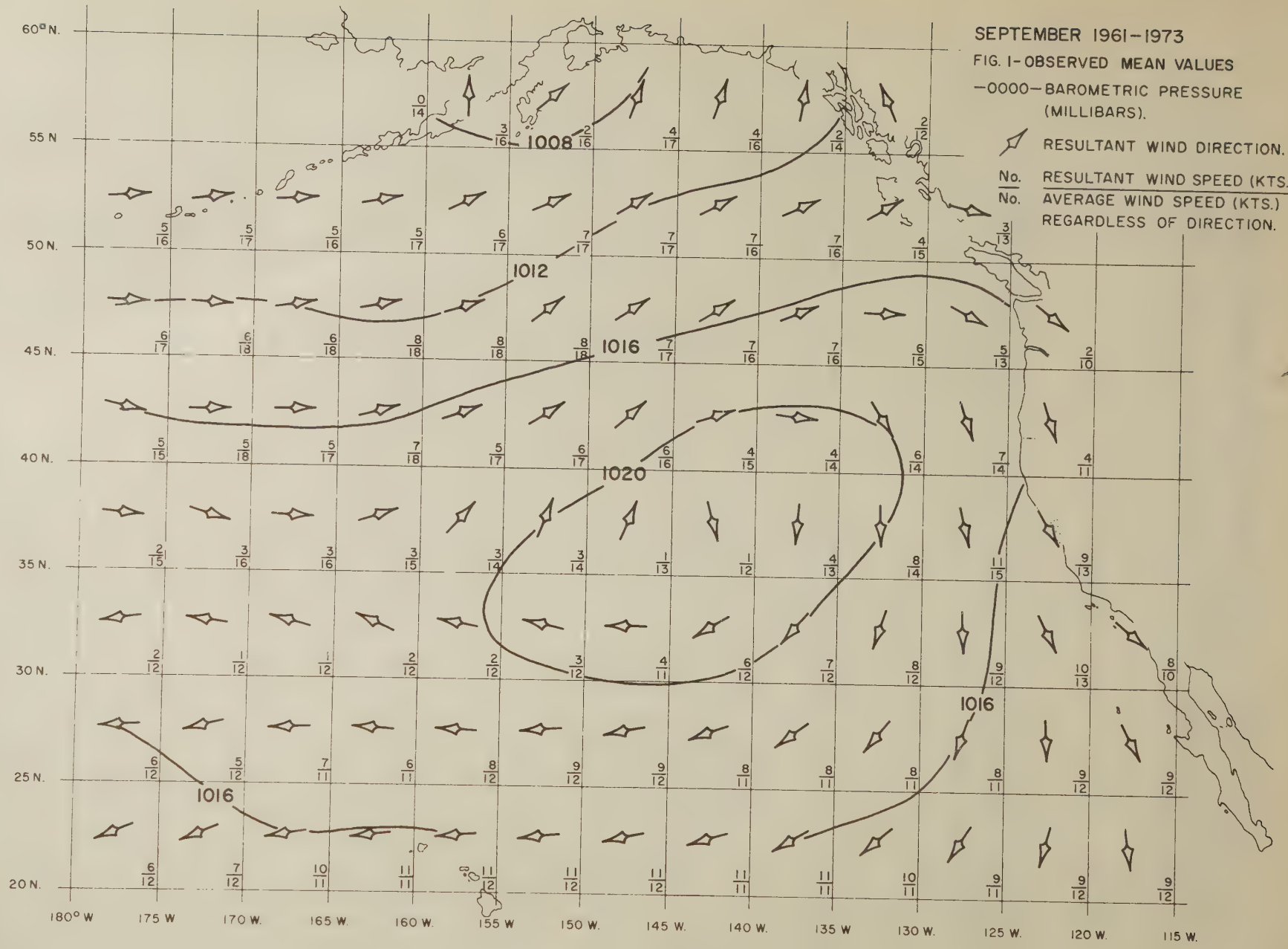
J. L. SQUIRE

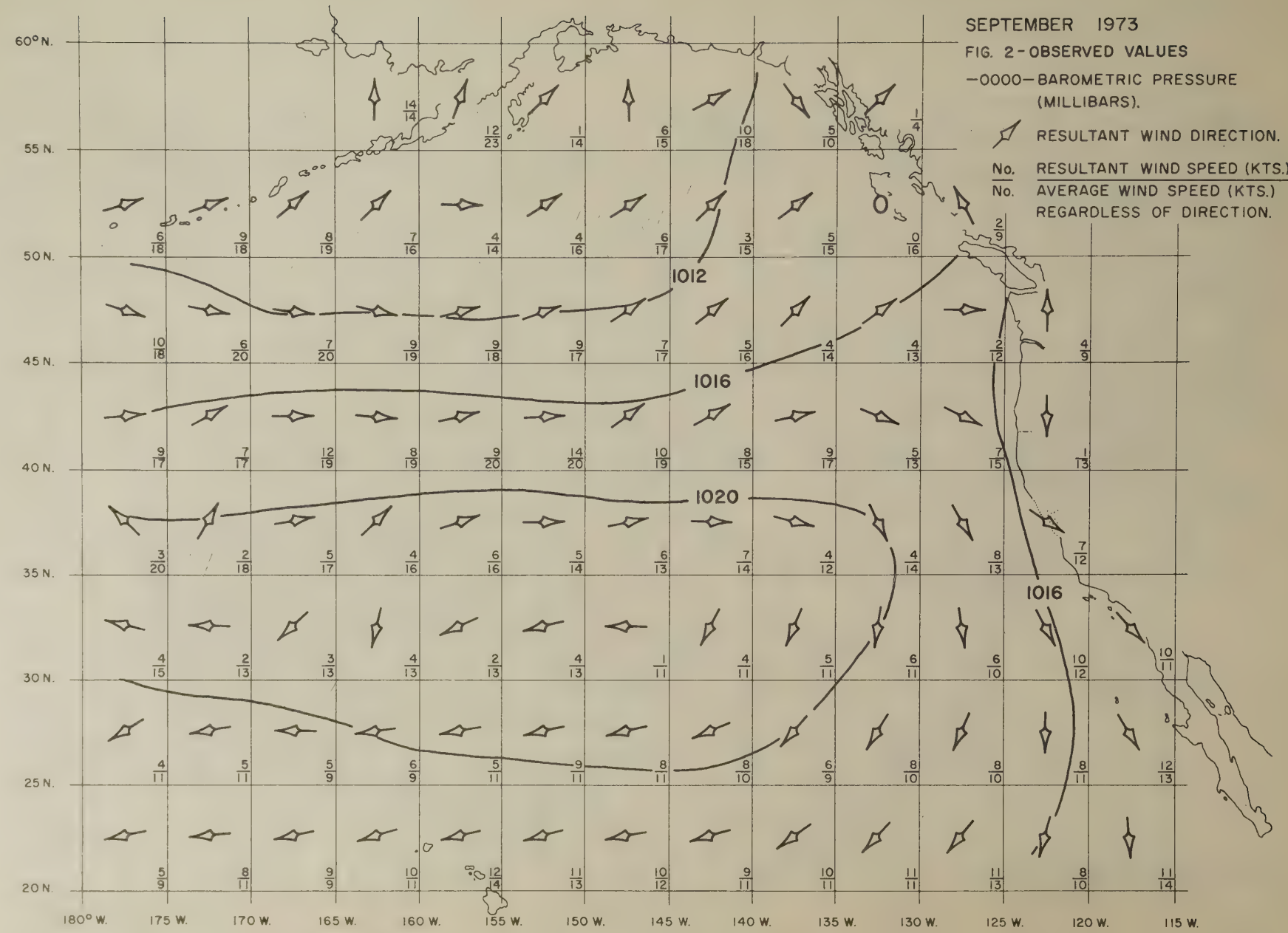
Sea surface temperature surveys are being conducted each week, April through October for the important fishing areas off San Diego. These surveys are part of a cooperative program between the NMFS La Jolla Laboratory and the California Department of Fish and Game to evaluate the effects of temperature changes on the distribution of important game fish species such as yellowtail, bonito, barracuda, white sea bass and other species entering the sport catch.

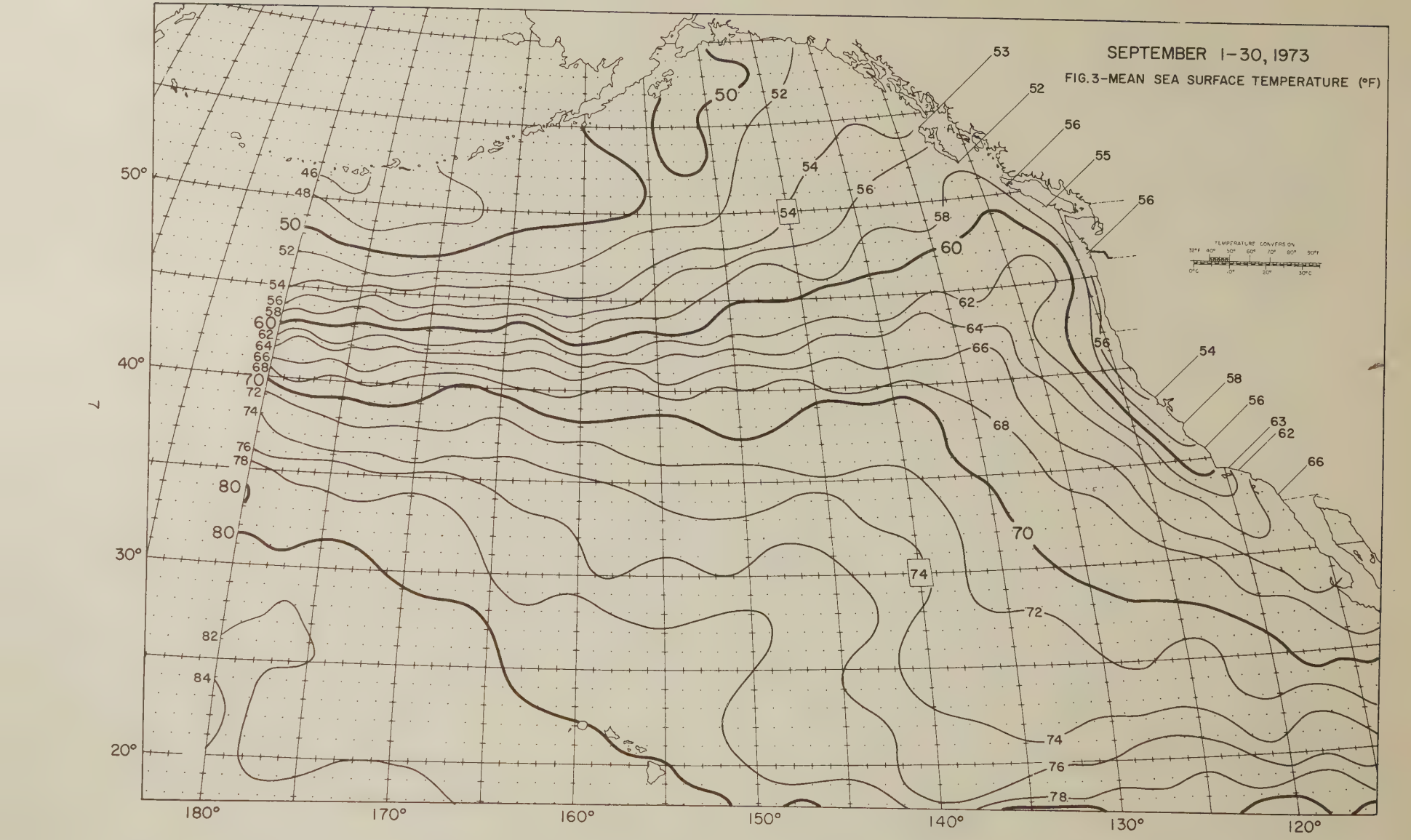
The first series of monthly charts appeared in the April issue of Fishing Information.

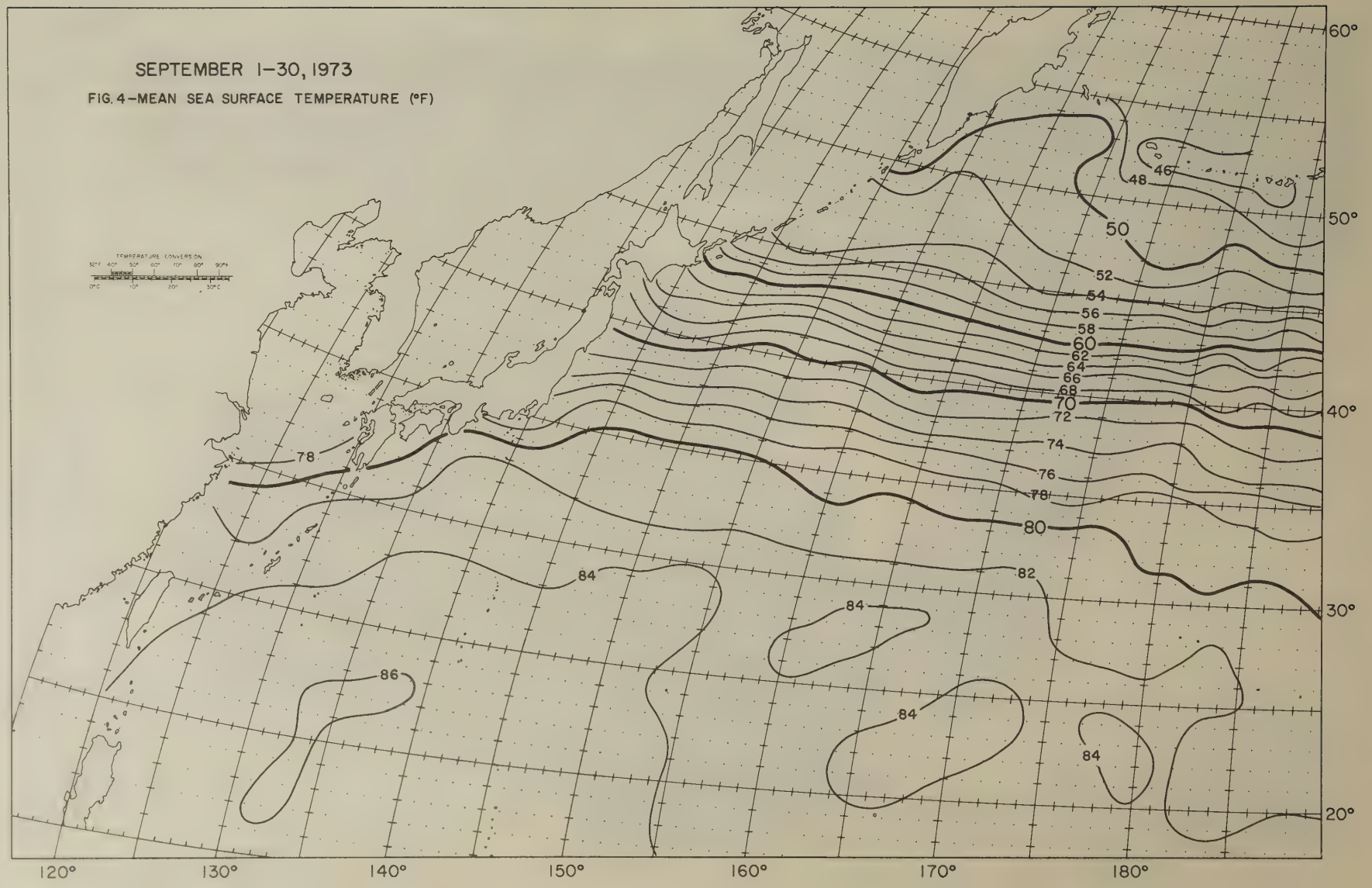
During September 1973 four survey flights were conducted and the approximate temperatures at the major fishing locations in °F are shown below (for conversion to °C consult the charts). 1972 temperature data for the corresponding periods are shown in parenthesis (64° etc.). The difference between the 1972 measurement and that observed in 1973 is given below the 1973 temperature.

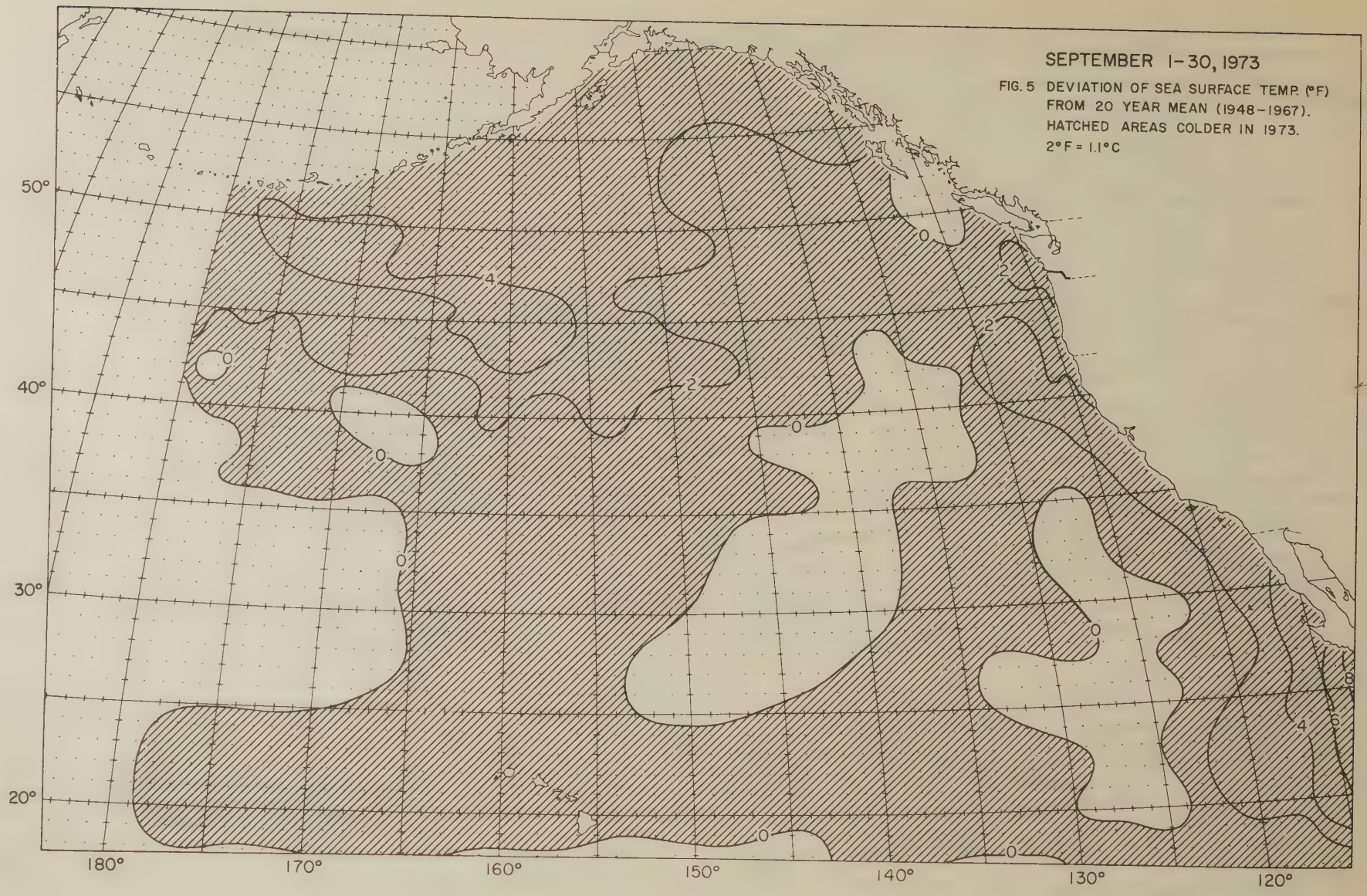
Survey Date	La Jolla Kelp Area	Point Loma Kelp Area	Tijuana Kelp	Coronado Islands
	1973 1972	1973 1972	1973 1972	1973 1972
September 6, 1973	66° (67°) -1°	66° (70°) -4°	62° (66°) -4°	67° (71°) -4°
September 10, 1973	66° (69°) -3°	66° (69°) -3°	64° (67°) -3°	65° (68°) -3°
September 17, 1973	66° (64°) +2°	66° (65°) +1°	62° (64°) -2°	66° (66°) —
September 24, 1973	65° (68°) -3°	64° (68°) -4°	63° (68°) -5°	63° (69°) -6°

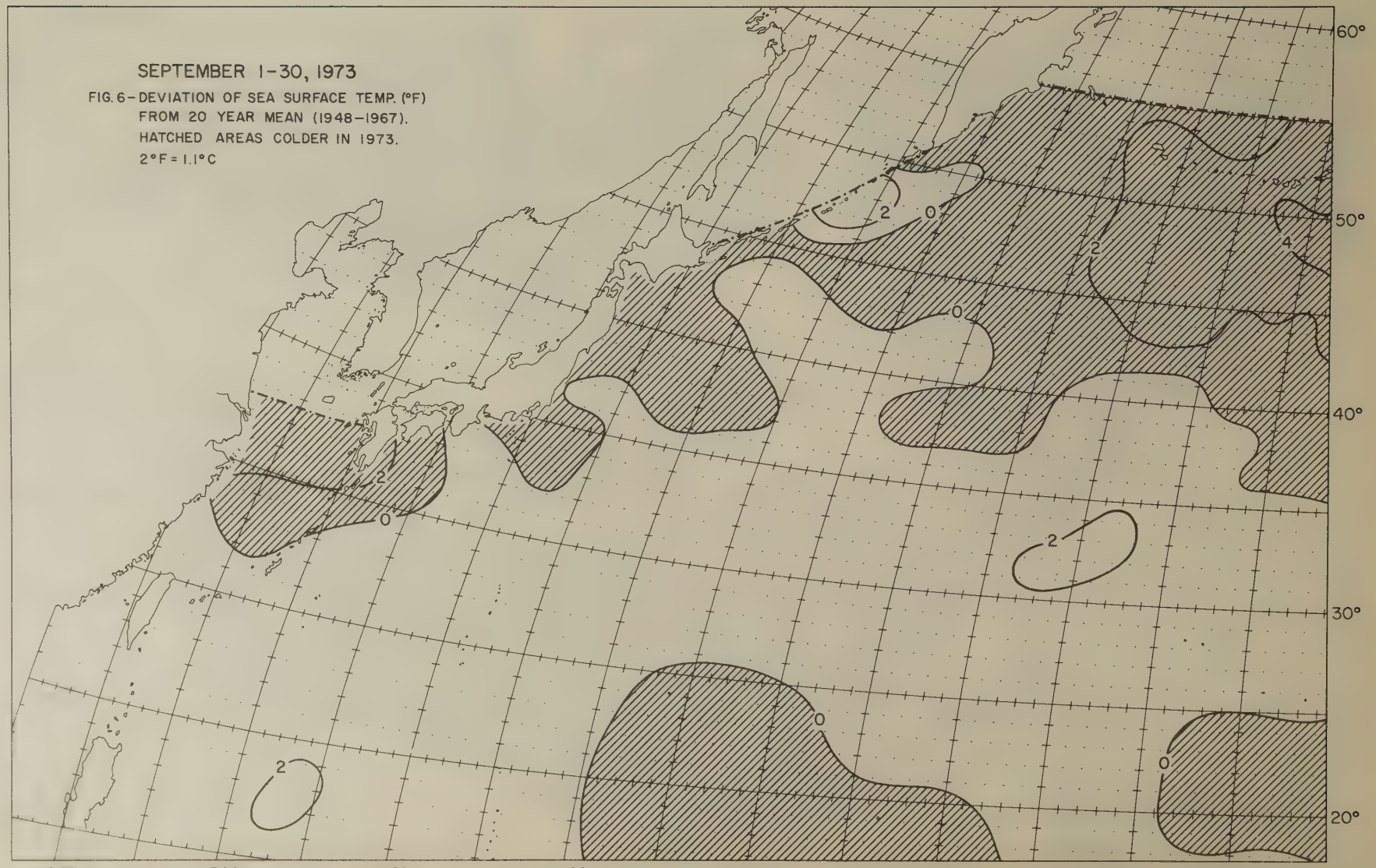

SEPTEMBER 1961–1973
FIG. 1–OBSERVED MEAN VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1008
1012
1016
1020
1016
1016
60° N.
55 N
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W
175 W
170 W.
165 W.
160 W.
155 W
150 W.
145 W.
140 W.
135 W
130 W.
125 W.
120 W.
115 W.

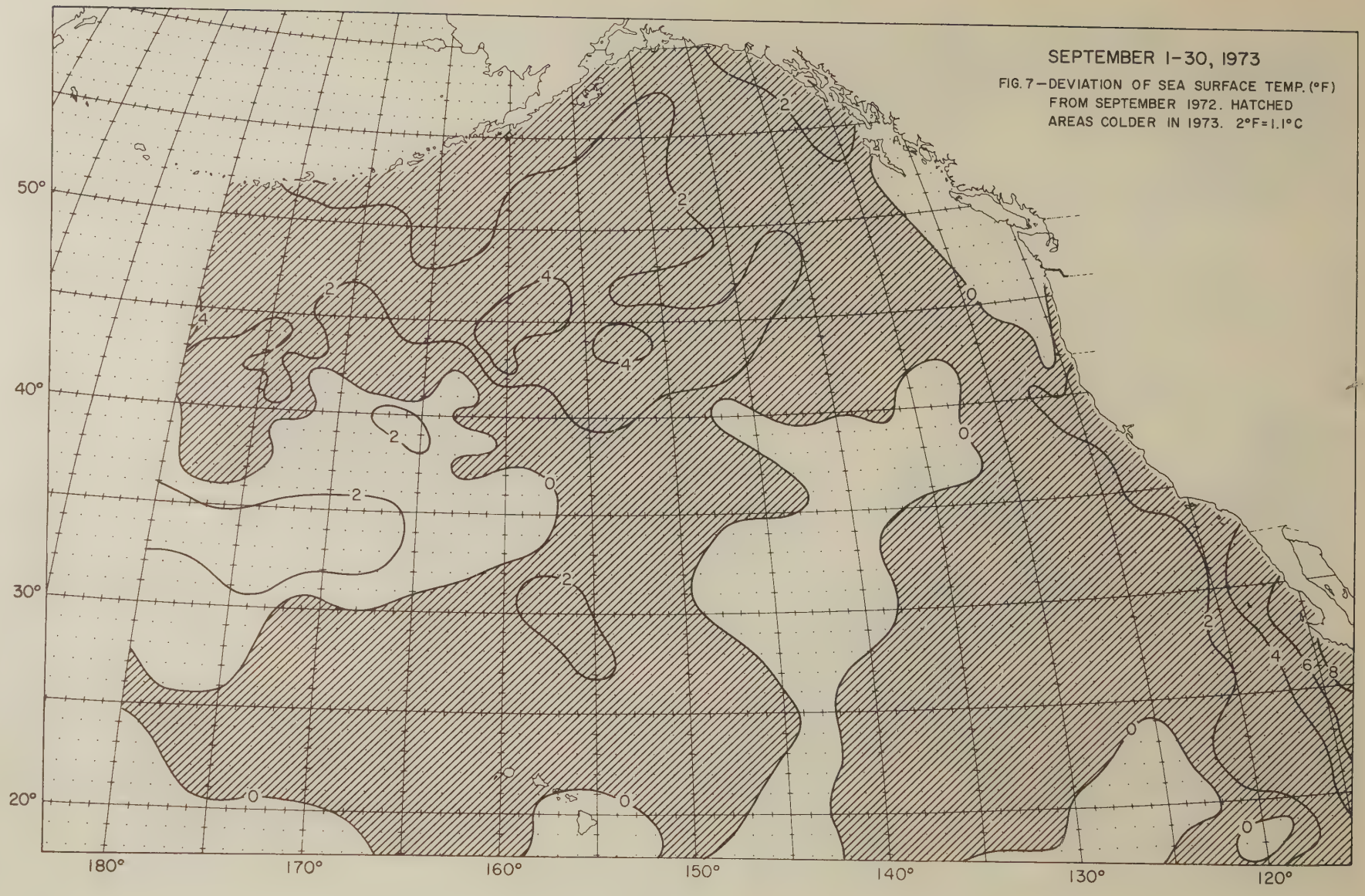

SEPTEMBER 1973
FIG. 2 - OBSERVED VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1012
1016
1020
1016
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

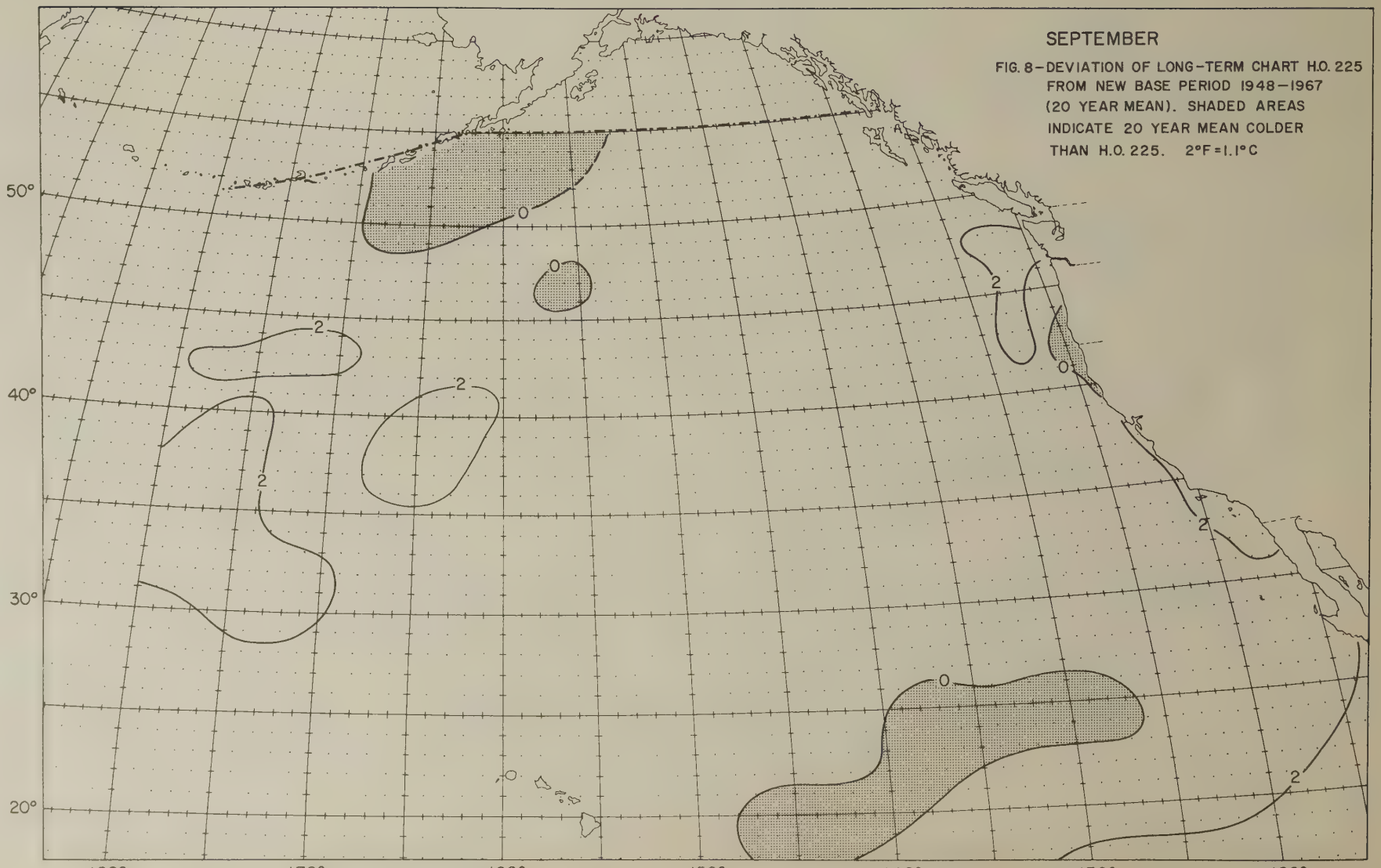

SEPTEMBER 1-30, 1973
FIG.3-MEAN SEA SURFACE TEMPERATURE (°F)
TEMPERATURE CONVERSION
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°

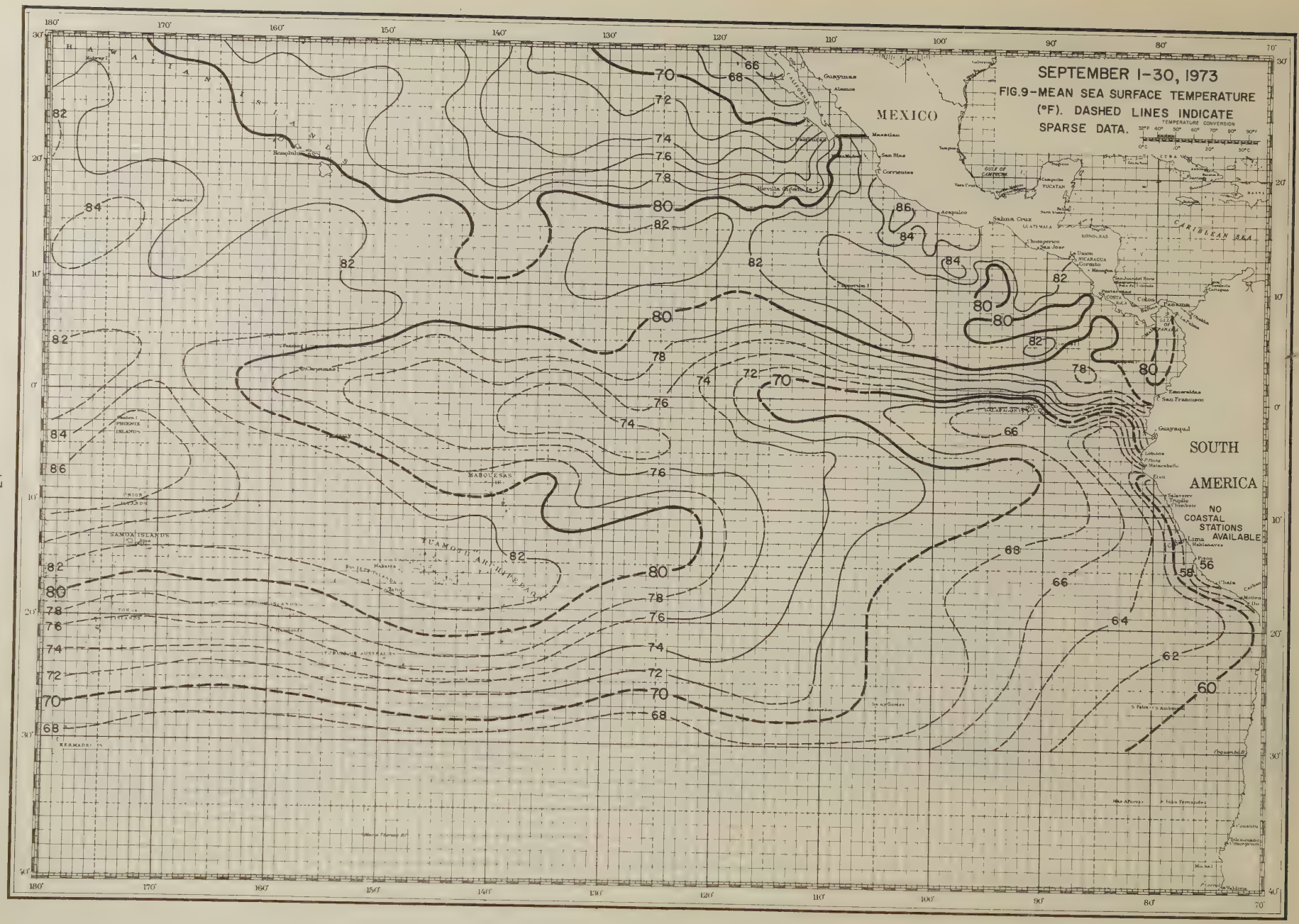

SEPTEMBER 1–30, 1973
FIG. 4–MEAN SEA SURFACE TEMPERATURE (°F)
TEMPERATURE CONVERSION
46
48
50
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
84
84
84
84
86
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°

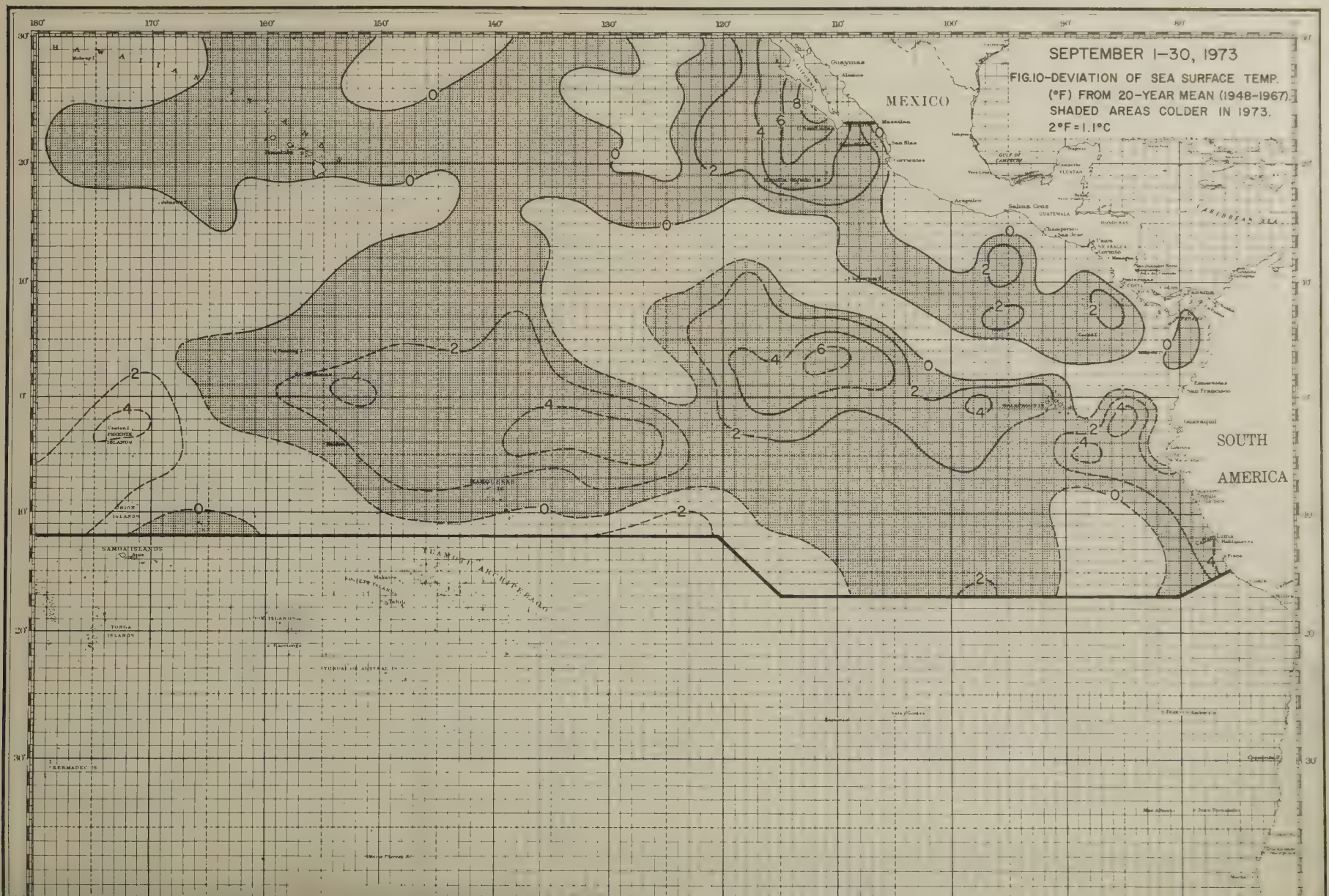

SEPTEMBER 1-30, 1973
FIG. 5 DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20 YEAR MEAN (1948-1967). HATCHED AREAS COLDER IN 1973.
2°F = 1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
0
2
4
6
8


SEPTEMBER 1-30, 1973
FIG. 6 - DEVIATION OF SEA SURFACE TEMP. (°F)
FROM 20 YEAR MEAN (1948-1967).
HATCHED AREAS COLDER IN 1973.
2°F = 1.1°C
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°
0
2
4


SEPTEMBER 1-30, 1973
FIG. 7—DEVIATION OF SEA SURFACE TEMP. (°F) FROM SEPTEMBER 1972. HATCHED AREAS COLDER IN 1973. 2°F=1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°

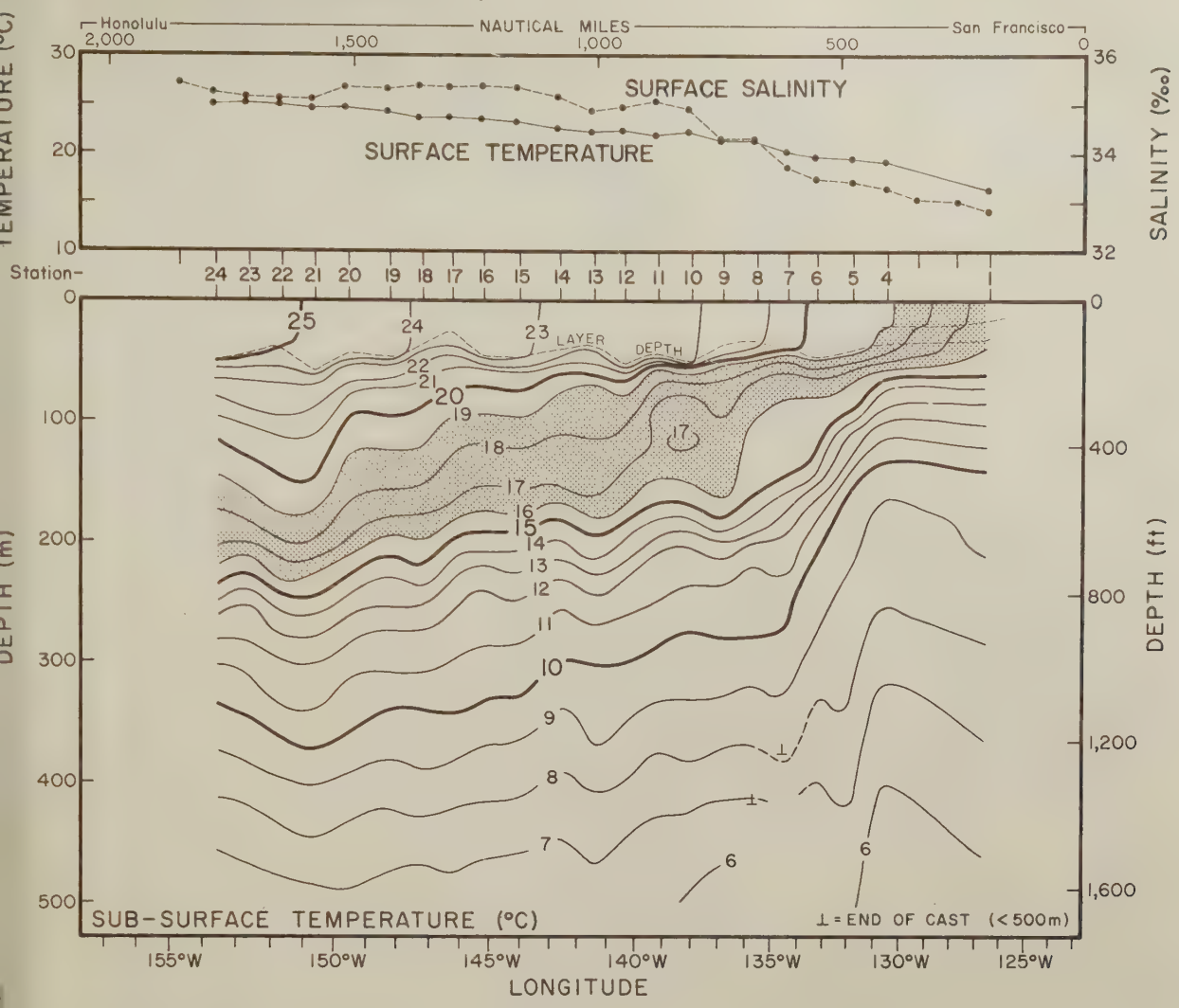

SEPTEMBER
FIG. 8–DEVIATION OF LONG-TERM CHART H.O. 225 FROM NEW BASE PERIOD 1948–1967 (20 YEAR MEAN). SHADED AREAS INDICATE 20 YEAR MEAN COLDER THAN H.O. 225. 2°F=1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
0
2

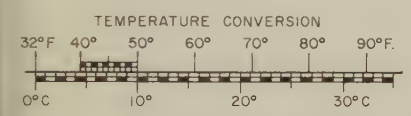

SEPTEMBER 1-30, 1973
FIG.9-MEAN SEA SURFACE TEMPERATURE (°F). DASHED LINES INDICATE SPARSE DATA.
TEMPERATURE CONVERSION
MEXICO
SOUTH AMERICA
NO COASTAL STATIONS AVAILABLE
CARIBBEAN SEA
HAWAIIAN ISLANDS
PHOENIX ISLANDS
SAMOA ISLANDS
TUAMOTU ARCHIPELAGO
MARQUESAS
TONGA ISLANDS
BERMUDA
GULF OF CALIFORNIA
YUCATAN
GUATEMALA
HONDURAS
COSTA RICA
PANAMA
NICARAGUA
Guaymas
Alamos
Mazatlan
San Blas
Corrientes
Acapulco
Salina Cruz
Colon
Guayaquil
Lima
Callao
Pisco
Chala
Mollendo
Arica
Iquique
Antofagasta
Valparaiso
Talcahuano
Juan Fernandez
Easter I.
Pitcairn I.
Rapa I.
Tubuai Is.
Raivavae I.
Rurutu I.
Rimatara I.
Rarotonga
Penrhyn I.
Manihiki I.
Rakahanga I.
Nassau I.
Suwarrow I.
Palmyra I.
Fanning I.
Christmas I.
Canton I.
Enderbury I.
Hull I.
Gardner I.
Howland I.
Baker I.
Jarvis I.
Malden I.
Starbuck I.
Flint I.
Vostok I.
Caroline I.
Ocean I.
Fakarava
Makatea
Tahiti
Moorea
Huahine
Raiatea
Tahaa
Bora Bora
Maupiti
Tupai
Manuae
Tonga
Fiji
Samoa
Niue
Tokelau Is.
Wallis I.
Futuna I.
Rotuma I.
Kermadec Is.
Norfolk I.
Lord Howe I.
Auckland Is.
Macquarie I.
Campbell I.
Antipodes Is.
Bounty Is.
Chatham Is.
Kaikoura
Wellington
Napier
New Plymouth
Auckland
Whangarei
Kaipara
Hokianga
Bay of Islands
Cape Reinga
Three Kings Is.
Kermadec Is.
Raoul I.
Macauley I.
Curtis I.
Sunday I.
Meyer I.
Esperance I.
Solander I.
Oeno I.
Ducie I.
Henderson I.
Pitcairn I.
Gambier Is.
Mangareva
Tuamotu Is.
Marquesas Is.
Nuku Hiva
Hiva Oa
Fatu Hiva
Ua Pou
Ua Huka
Eiao
Nukuhiva
Tahuata
Motane
Fatu Huku
Hatutu
Mohotani
Nuku Atavo
Ua Huka
Hatutaa

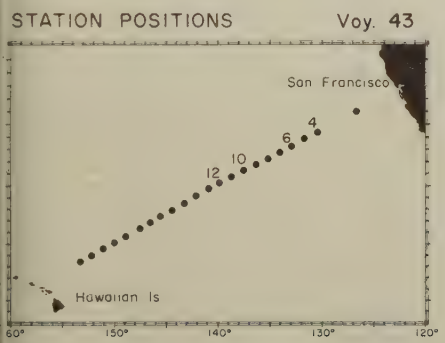

SEPTEMBER 1–30, 1973
FIG.10–DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20-YEAR MEAN (1948–1967). SHADED AREAS COLDER IN 1973.
2°F = 1.1°C
MEXICO
SOUTH AMERICA
HAWAIIAN ISLANDS
PHOENIX ISLANDS
SAMOA ISLANDS
TUAMOTU ARCHIPELAGO
EASTER ISLAND
CHILE
PERU
ECUADOR
COLOMBIA
PANAMA
CARIBBEAN SEA
GULF OF CALIFORNIA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
EQUATOR
180°
170°
160°
150°
140°
130°
120°
110°
100°
90°
80°
30°
20°
10°
0°
10°
20°
30°

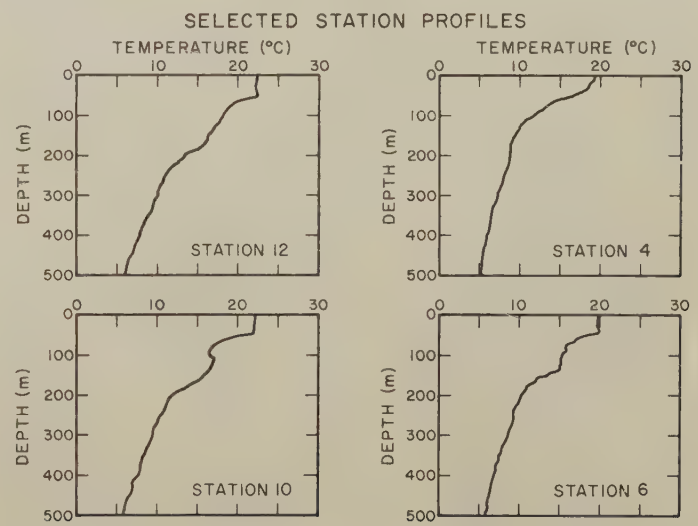
AUGUST 25–29, 1973
SS CHEVRON CALIFORNIA, Voyage 43

FIGURE 11



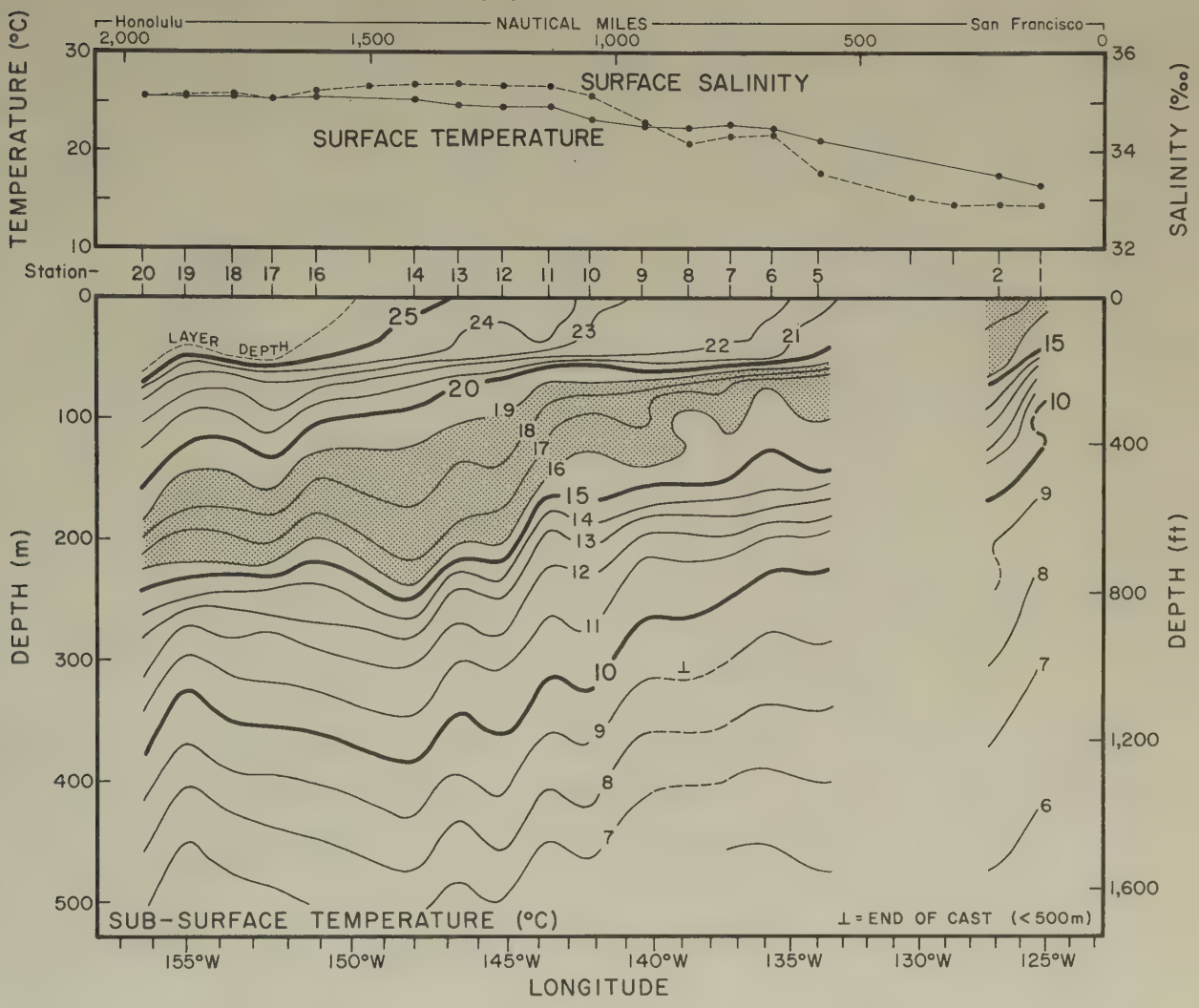


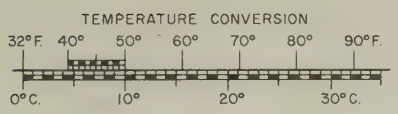


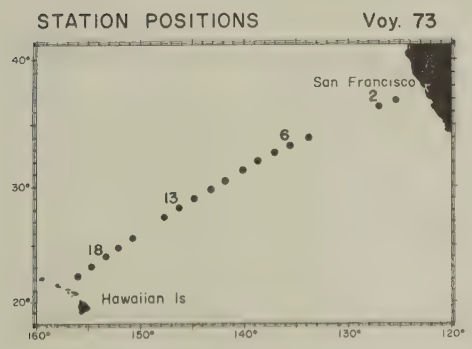


SEPTEMBER 15–19, 1973
SS HAWAIIAN ENTERPRISE, Voyage 73

FIGURE 12







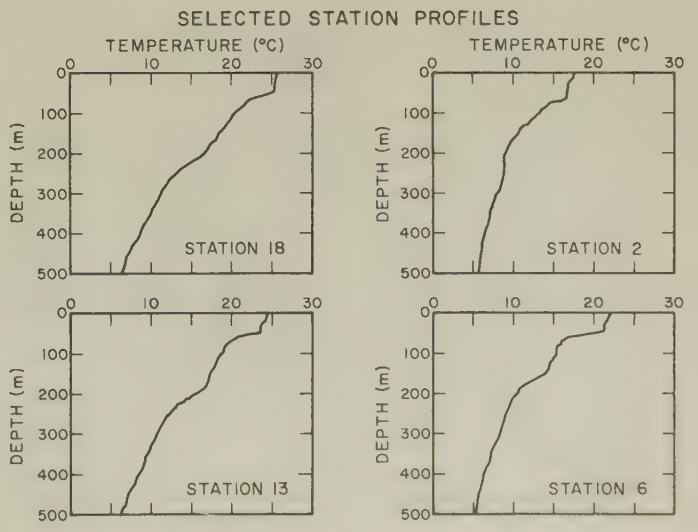
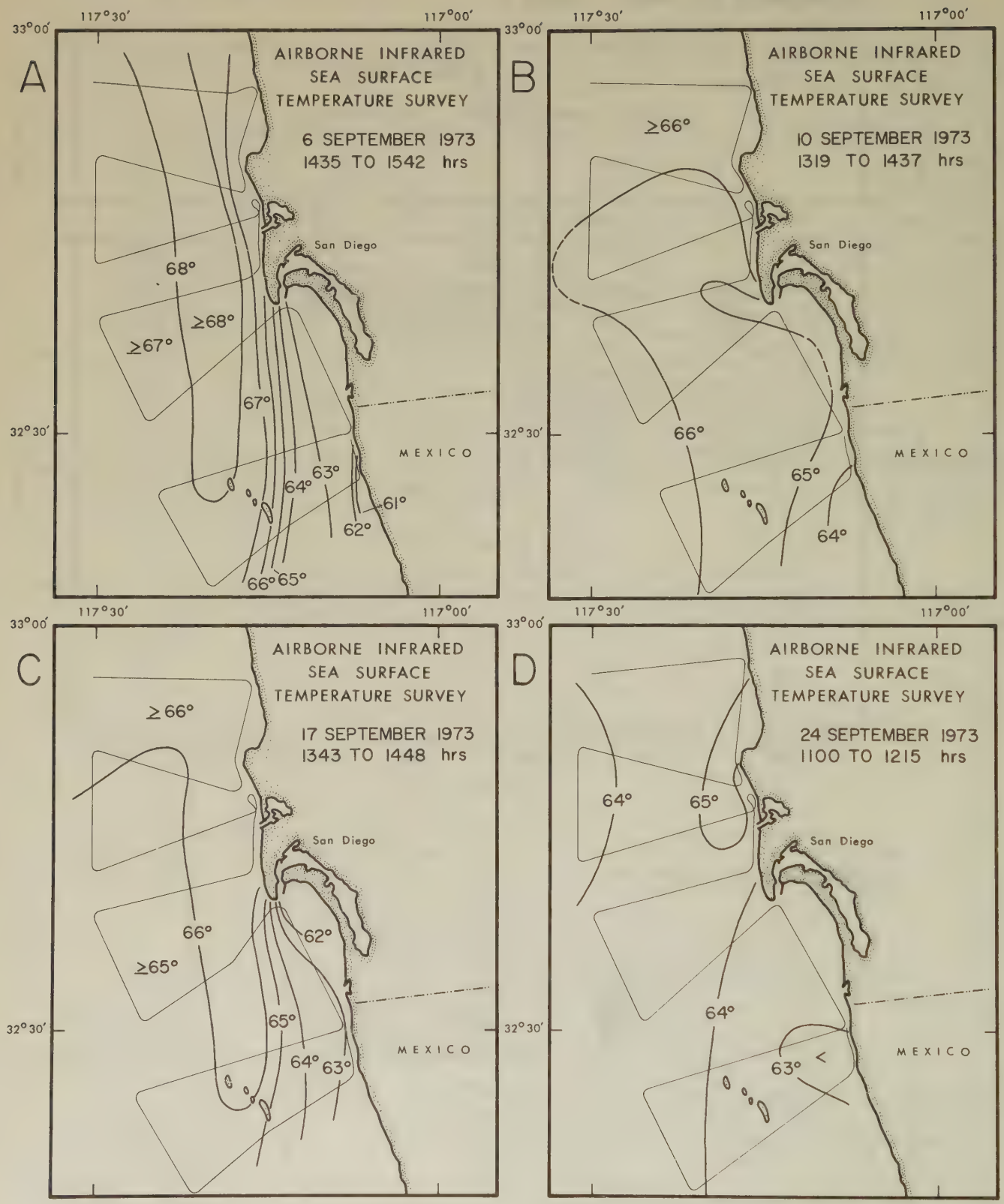
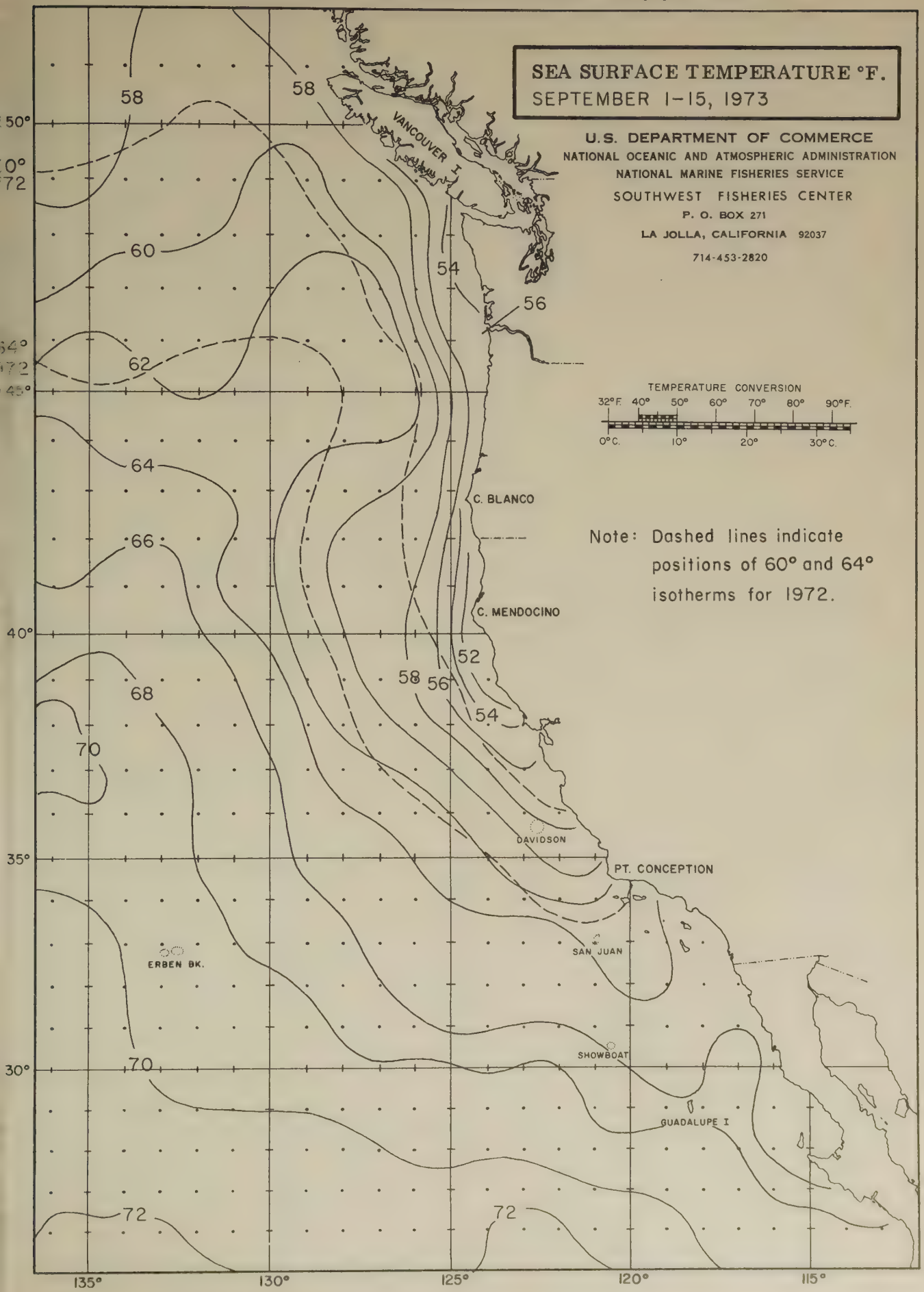


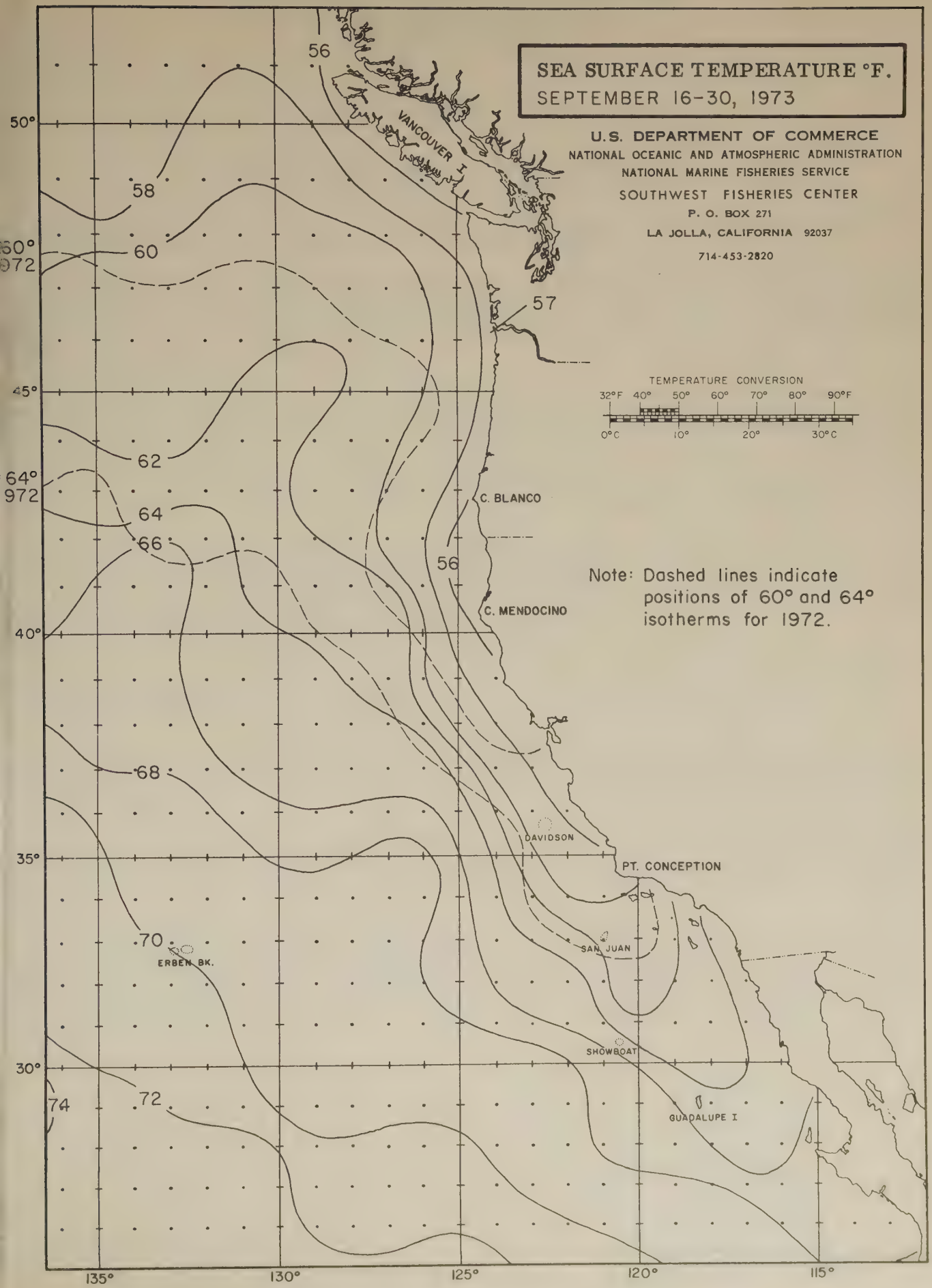
FIGURE 13 — SEPTEMBER 1973



FISHING INFORMATION – supplement



FISHING INFORMATION – supplement



UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
La Jolla, California 92037

FISHING INFORMATION BULLETIN NO. 73-6

GOOD ALBACORE FISHING CONTINUES IN PACIFIC NORTHWEST, IMPROVES OFF CENTRAL CALIFORNIA

Good albacore catches were made during the last 2 weeks of August, primarily from Vancouver Island to Queen Charlotte nds, Cape Blanco, Oregon to Westport, Washington and off Avila Beach, California.

High scores from the northern end of Vancouver Island to Cape St. James were consistently between 100-500 fish with rages between 50-300. Most of the catches were made in 59°-60° F (15.0°-15.6° C) waters within 60 miles of shore. The fish ged from about 10-16 pounds with 12-14 pound fish predominating. By August 30 it was reported that water temperature cooled newhat near Cape St. James in the Queen Charlotte Islands and fishing became spotty. Several good scores, however, were l being recorded near the north tip of Vancouver Island.

Locations of good fishing off Washington and Oregon were somewhat transient during the second half of August. From gust 15-19 many albacore boats were working near the "dumping grounds" off Astoria and the "fingers" off Westport where good ches of 200-400 fish per day were reported. But, on August 20 the area of best fishing was reported from about 250 miles west Astoria, and on August 21 good catches were made 35-80 miles off the Siuslaw River and Coos Bay. On August 27 good scores re reported off Newport. During the last week of August catches off central and southern Oregon continued to be fairly good h high scores of 100-400 fish daily on mixed-size albacore averaging 13-14 pounds. However, by the end of August boats off vport were moving further offshore and vessels in the Coos Bay area were moving towards Cape Blanco and south.

Poor weather hampered fishing in the area between Avila Beach and Morro Bay through most of the last 2 weeks of August. all catches were made on August 15 and 16, but rough seas forced boats into ports until August 24. After "scratch" fishing for first few days after returning from port, good fishing on 17-20 pound fish developed on August 27 in the area about 40-70 miles Avila Beach. By August 30 baitboats in this area were taking 100-400 fish a day and jig boats were taking about a ton per day. otty fishing was also reported from Guide Seamount to the 1908 fathom spot during the first few days of September. Water temratures in the vicinity of the good fishing off Avila ranged from 60°-62° F (15.6°-16.7° C).

Albacore landings increased during the past month and at the end of August the seasonal total is estimated to be about 000 tons. This is somewhat below the 1963-72 average of about 11,000 tons and much below last year's seasonal total at the d of August, which was about 15,000 tons.

Strong northerly winds along the southern region and northern and central California coasts caused continued cooling of surface temperatures during the last half of August. Coastal waters south of Cape Blanco to Point Conception were 2°-4° F der than they were during the previous 2 week period, and sea surface temperatures remained below normal from Cape Blanco th to offshore Baja California.

North of Cape Blanco, decreased winds allowed coastal sea surface temperatures to increase by 2°-4° F from those during first half of August. As a result, water temperatures climbed to above normal values offshore Washington and Vancouver and. South of Point Conception, sea surface temperatures continued to be 2°-4° F below normal in waters offshore southern Baja California.

The Long-Range Prediction Group of the National Weather Service expects atmospheric pressures, both at sea level and ft, to be below normal over the eastern north Pacific during September, while air temperatures are expected to be below rmal over the west coast states. These conditions should result in fewer periods of strong northwesterly winds than those t occurred throughout July and August off northern and central California. While occasional weak weather fronts will move and over the Pacific Northwest, it is expected that the more intense storm systems that develop south of the Aleutian Islands l head into western Alaska.

tember 5, 1973

Staff, Albacore Fishery Investigations
R. Michael Laurs, Leader

UNITED STATES DEPARTMENT OF COMMERCE
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NATIONAL MARINE FISHERIES SERVICE
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FISHING INFORMATION BULLETIN NO. 73-7

ALBACORE FISHING REMAINS GENERALLY GOOD

Albacore fishing continued to be generally good during the first 2 weeks of September with best catches in Pacific north-waters and off central California.

Many of the larger jigboats operated between Cape Flattery and Tasu Sound, Queen Charlotte Islands with best catches ted from the Dellwood Knolls area off Vancouver Island. Scores averaged as high as 200 albacore per day per boat and top s were up to 300 fish per day on 12-14 pound fish. Most fishing was in waters with surface temperatures of 58°-60° F -15.6° C). On September 9-10 scores of 140 fish were also reported from 15-30 miles west of Tasu Sound.

Rough seas and strong winds hampered fishing off much of Washington and Oregon during the first week of September. ver, from September 7-13, baitboats fishing 40-60 miles off Astoria caught 1-7 tons per day on fish larger than 20 pounds - albacore from this area were more than 40 pounds. By the end of the second week of September however, baitboat fishing e Columbia River became scattered. Fishing by jigboats off Oregon during the second week was only fair with many of the scores off Astoria, Newport and Coos Bay between 40-100 fish a day.

Fishing in central California waters has been centered 80-90 miles off Morro Bay in 59°-60° F (15.0°-15.6° C) waters on arger than 20 pounds. Some scores up to 6 tons per day were reported by small baitboats while jigboats landed about 2 tons or 4 days of fishing. Good, but scattered catches continued off Davidson, Guide and Pioneer Seamounts, and near the llon Islands. Some 200-300 fish scores were also made during the second week of September from the Gorda Seavalley and iles off Fort Bragg. Albacore from the Gorda Seavalley averaged 15 pounds. Scores up to 150 fish per day were also re-d near the "rockpile" off Crescent City during the second week of September.

Sportboat catches off Morro Bay have generally been good with daily catches up to about 2-3 fish per angler.

During the first 2 weeks of September, strong winds off the Washington and northern Oregon coasts caused sea surface eratures to decrease by 2°-4° F from their values during the last half of August, and temperature anomalies changed from F above to 2°-4° F below normal in this region. South of 45° N to Point Conception, less frequent periods of strong north to westerly winds allowed sea surface temperatures to increase by 1°-4° F; however, waters are still from 2°-4° F below al along the entire west coast from Cape Flattery to offshore southern California.

The 60° F isotherm, which reached its maximum northward extension during August has begun moving southward and will nue to do so as normal seasonal cooling begins.

According to information supplied by the Long-Range Prediction Group of the National Weather Service, sea level pressures xpected to be near or slightly below normal over the eastern North Pacific and west coast states through the next few weeks. equently, weather conditions should remain favorable for fishing along the Oregon and California coasts during this period. occasional weather fronts will move inland over the Pacific Northwest, the more intense storm systems are expected to out of the Gulf of Alaska into eastern Alaska and western Canada.

mber 17, 1973

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